4MinX

Portable Mixer/Recorder

User manual

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Revision:
J – Build on firmware V1.7.5

Introduction

4MINX is a portable mixer specially designed for outside recording.

4Minx is new kind of product on this market. It can be use as a traditional mixer, but can be use as a multi tracks recorder. In same time, it can manage digital audio treatment in real time.

This equipment is suitable for sound production, with its remarkable audio features and its full compatibility with « M/S » and « surround » systems. 4Minx have 4 Mic/Line inputs, with all power phantom and limitor, 2 digital inputs AES3. Digital inputs support the normalization AES42 for digital microphones (10v phantom power).

4Minx has many outputs, 6 analog channels and 6 digital channels AES3.

The routing capability for each input and each output give complete liberty to the user.

The multi tracks recorder can grow up to 8 tracks on SD/SDHC card and can make a backup on external USB disk. You should use SD/SDHC card Class 10 or similar to avoid problems.

A project management included in the unit gives the opportunity to make many sounds recording without problem.

4MinX has a keyboard and a 3" TFT high quality display, offer a simple and nice user interface. On 4Minx the user can set its own mixer interface in regards inputs and outputs need in his configuration.

To start a work quickly, you can read the quick start delivery with the unit. It will provide you all details step by step to start a record.

1. Technical Characteristic

- Light weight and small dimensions (1.9 kg, 260 x 75 x 195 mm)
- 4 Mic/Line transformerless inputs, very low noise (-128dBu)
- Adjustable input gain, 10 dB steps, 0 to +50 dB
- High-pass filters on each channel
- Maximum overall gain: 90 dB, useful for dynamic and ribbon microphones
- Maximum input level: +19 dBu without pad
- Input headroom: 40 dB, independent of input stage gain
- LED for overload warning on each input channel
- Fast limiter on each input, 40 dB operating range, with LED indicator
- Stereo or M/S coupling on inputs 1&2 et 3&4
- Stereo ↔ M/S encoder/decoder on inputs 1 & 2, 3 & 4
- 4 main line outputs, maximum level adjustable from -9dBu to +22dBu
- 2 return or auxiliary line inputs, maximum acceptable level adjustable from -9dBu to +22dBu (for 0dBFS)
- separate Stereo ↔ M/S encoders/decoders, for monitoring
- 2 unbalanced outputs (level 6 dB below the balanced outputs)
- 3" QVGA TFT screen with adjustable brightness, displaying large scale bargraphs (50 dB dynamic range)
- High performance headphone amplifier, with selectable source and listening mode
- Long operating range on Li-Ion DV battery and charger inside
- 3 AES3 digital outputs, stereo, 24 bits, up to 96 kHz
- 2 AES3 digital inputs with phantom +10V for AES42 microphones with sample rate convertor.

2. AUDIO Interfaces

The functions of the analog and digital mixer are shown on the functional diagram that can be found in annex,“Block diagram”. On next paragraph, we will describe in detail all inputs and outputs of the 4MinX

2.1. Audio Inputs

2.1.1. Input “Mic/Line”

Each of these four inputs is available on a 3-pin female XLR socket, and is electronically balanced. Each input support 48V phantom power or T12 power. If no powering is active, unbalancing an input has no negative impact on the performance.

. Each input has its own volume control on the front panel, generally named « fader ».

Specificities:

- Inputs 3 and 4 can also be fed from the “EXT I/O” socket, in which case ***no microphone powering*** is available
- Input 1 and 2 can stand very strong audio levels thanks to a 20 dB attenuator. When it is enable, the input level can grow up to +39dBu.

Functions of the “MIC/Line” inputs

The following functions are available on each input, via a selection in the menu:

- Input stage gain setting, 0dB to +50dB, 10dB steps;
- Phantom power for a microphone, 48V, or “Tonader 12V” ;
- Analog high-pass filtering, 50 Hz cut-off frequency, 18dB/octave;
- Digital high-pas filtering, 50 Hz to 200Hz 12dB/octave and 300 Hz, 6dB/octave, suitable for compensating proximity effects in directional microphones
- Polarity inversion (phase reversal)
- Fast limiting, with “soft knee”;
- Routing to Left or Right bus, or Center (i.e. L and R), with pan-pot, or not routed at all
- The “risk of overload” LED begins to light at 12 dB below overhead.
- Attenuator (20dB) can be enable on the mic/line input 1 & 2
- Delay between 0 to 7ms by 0.1ms step

Note:

- The 50Hz analog filter can be enabling in the same time as the digital filtering. In this case rate will be 32dB/Oct below 50Hz.
- A limiter can be inserted into each channel (post-fader). Its activation is shown by a green LED that turns red when the signal begins to limit.

Stereo and M/S

Via menu selection, channels 1 and 2, 3 and 4 can be used as independent channels or coupled for stereo or M/S operation. When used as a couple of stereo or M/S channels, the channel impair becomes the master, controlling the level of both channels. The channel pair provides +/-5dB adjustment of the balance in L/R mode (normal stereo), or the stereo width in M/S mode.

In normal stereo mode, the transducers usually have matching sensitivity:

- Any change of the input gain on one channel induces the same on the other channel;
- The even channel control controls the balance between L and R channels by +/- 6dB

- Input odd is routed to the Left bus, input pair is routed to the Right bus
- The even input is routed on the mix down Left and the odd on the mix down right. But, Over writing these routing remains possible!

In "M/S" mode the transducers often have different sensitivity:

- The input gain adjustment is kept separate for channels odd and even,
- The odd channel control adjust the couple level
- The event channel control adjusts the stereo image width. In the center detent position, a coherent couple should provide a normalized 110° angle
- Whenever inverting the phase of channel even, after decoding from M/S to L/R the stereo image is reserved L↔R
- Manual routing is inhibited and the signals are routed and decoded as follows:
  Input impair is the "M" signal, input pair is the "S" signal;
  Input impair + Input pair (M+S) is routed to the Left bus;
  Input impair - Input pair (M-S) is routed to the Right bus.

Limiters

A limiter can be inserted into each channel, after the channel fader. This is a fast limiter with a dynamic range wide enough to stand the 40 dB overhead of the input stage. The activation of the limiter is shown by an LED.

As long as the signal level stays below the limiter threshold, little effect is seen on the signal. When the limiter is triggered, its output stays 6dBFS below the A/D converter clipping level for up to 40dB input overdrive.

It can thus be seen as a "safety" limiter, that may be left active all the time!

The threshold can be adjusted through the menu from –12dBFS to –3dBFS

Note: In case of use specific coupling the limiters are coupling together, which is the required mode for applying simultaneous and identical gain reduction to both channels in « stereo » and M/S modes, in order to preserve the coherence of the stereo image.

2.1.2. Line inputs/return

Two inputs are available on a 5-pin female XLR socket, and are electronically balanced. It is possible to unbalance an input without negative impact on the performance. Each channel has its own maximum level adjustment in the menu from -9dBu to +22dBu (for 0dBFS). Theses inputs can be use as a return from video camera but can be use as more analog entries for the mix down or the recorder. It is possible to have a fader control on each input through P1 to P4. In this case, we provide you 15dB more gain.

Theses inputs have digital high-pas filtering, 50 Hz to 200Hz 12dB/octave and 300 Hz, 6dB/octave, suitable for compensating proximity effects in directional microphones

Delay can be inserted on theses inputs. The delay can be set between 0 and 7ms by 0.1ms step.

2.1.3. Embase “EXT I/O”, Récepteurs HF

The “EXT I/O” socket is available for the connection of an optional extension box. This device can be used to interface 4MINX with radio transmitters and/or receivers.

When the extension device is plugged into the “EXT I/O” socket, the mixer can use, for channels 3 and/or 4, inputs from the EXT I/O socket instead of XLR inputs 3 and 4. In this case NO microphone power is apply on these inputs.

The extension device feeds these inputs with two balanced signals. *For safety, no microphone powering is inserted into these inputs on the EXT I/O socket* but all others settings are the same.

On this interface, you have 2 asymmetrical outputs. Theses outputs are described on the need paragraph.

Note: A 9V/ 600mA power supply is available on the connector.

2.1.4. AES Inputs

4MINX can accept AES3 digital audio input on its « Dig. In » (XLR 3 pins). Signals can be routed or mixed in the bus as others inputs or send to any outputs.

The input 1&2 can be used to synchronize the 4minx on another machine. This feature can be set in the synchronization menu, it is necessary to specified in the same menu the frequency of the AES signal. Both digital inputs are using a sample rate convertor when you are in master mode.

Note: Don't forget to set the right sample frequency on the synchronization menu when you want to use the AES input as synchronization

Theses inputs have digital high-pas filtering, 50 Hz to 200Hz 12dB/octave and 300 Hz, 6dB/octave, suitable for compensating proximity effects in directional microphones

Delay can be inserted on theses inputs. The delay can be set between 0 and 7ms by 0.1ms step.

2.2. Audio outputs

2.2.1. Main outputs “Line Out”

4Minx have 2 stereo line outputs on XLR 5 pins. By menu, you can set source for each channels between all inputs, bus, monitoring.

The signals are electronically balanced; they can be unbalanced with no impact on performance, as long as the level stays below +19dBu.

The maximum output level (which corresponds to the maximum digital level, 0dBFS) is adjustable via the menu, from -9dBu to +22dBu.

Also via the menu, a 40dB attenuator can be inserted on each output channel, so providing a “microphone level” signal.

2.2.2. Unbalanced “Line Out”

The same signals of the first “stereo” line output as found on the XLR5M socket are also fed to a 3.5mm stereo mini-jack socket. These signals are unbalanced, and their level is **6dB below** those on the balanced XLR5M **.**Their typical use is for linking the mixer to a semi-professional recorder (Mini-Disc, cassette, DAT…) or connecting a second headphone

2.2.3. Analog outputs for radio transmitters

The L and R mix buses or any inputs can output on the « EXT I/O » socket (on the left side of the unit), with a separate adjustment of the maximum level for each channel from -20dBu to +10dBu, which allows a suitable adaptation to most radio transmitters. These outputs are asymmetrical.

2.2.4. Digital outputs

4MINX delivers 24-bit stereo digital outputs; it is possible (via the menu) to select either a “Pro” mode or “Consumer” mode, depending on the type of equipment the signals are fed to.

A balanced and transformer isolated AES output (110Ohm impedance) is available on the “Dig. Out” socket. It is possible to connect this AES output to a SPDIF input through an adaptor cable (optional: see Annex).

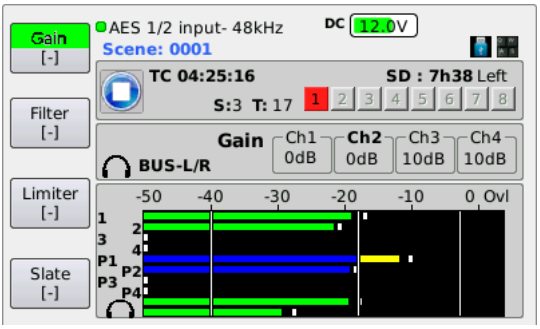
2.3. Monitor

2.3.1. Display screen

The display screen of 4MINX is a 3” color QVGA TFT display. This technology features a very wide viewing angle and fast response time. The display brightness is adjustable, it has latest technology for a perfect outside used.

On the main screen:

- The monitoring audio level of left and right signals are showing at the bottom of the display
- Just over them the level of the four microphone inputs in post and pre fader are shown.



- Levels are displayed on large scale bargraphs covering -50dBFS to 0dBFS.
- By menu you can set 4 metering level threshold (Minimum, nominal, yellow, red)
- They are measured with fast PPM ballistics.
- In addition, peaks are held on for about 4 second (“peak-hold” function)
- An “OVL” icon shows up whenever the level reaches -3dBFS or more.
- Input number are display in red when you enable a coupling between us (when 2 stereo or M/S coupling are selected, the second is show in blue).
- If you select pre fader by menu for the input, a ‘P’ is display

2.3.2. Configuration

The « Monitor » function allows the selection of signals inside 4MINX for displaying their levels on the screen and monitoring them on headphones

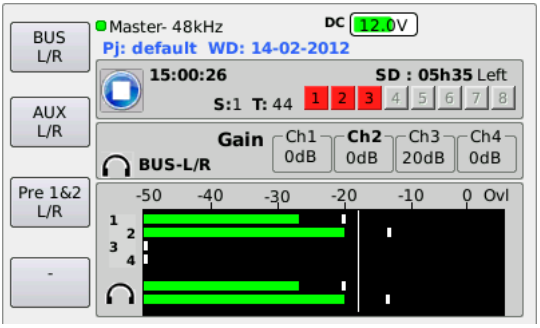
Just by pressing monitor key and moving the rotary, you can select the following signal sources for monitoring:

- Input 1 to 4, in post or in pre ***fader***
- Channel couple : AES 1&2, AES 3&4
- Return/Line In couple of signals
- Bus
- …

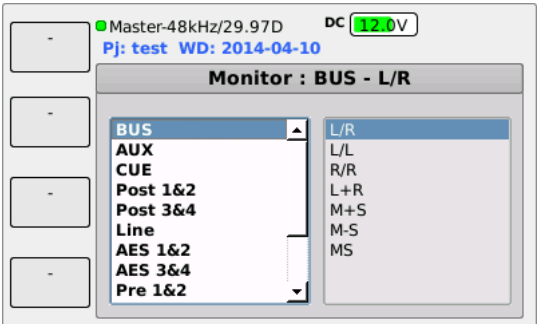
Note: The selection can be affected on one of function key (F1 to F4) by a press on it.

A second bank is available by pressing the Shift

You have a total of 8 monitoring presets



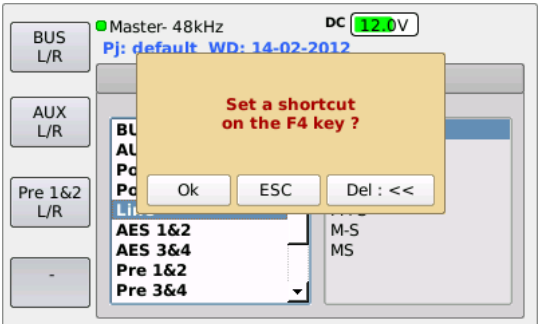
Note: When presets are available, you should press twice the monitoring key to access to this menu.



Note: press the monitoring key to swap between sources and mode.

To set a shortcut key, you have just to press it under this display. The current selected source and mode will be saving on this shortcut key.

Example: Set preset F1



2.3.3. Headphone monitoring

The headphone can be plugged into a stereo 6,35mm jack socket. By pressing twice the monitoring key and vertically moving the cursor with the rotary, the monitor mode can be selected among the following:

- L/R : Normal stereo listening ;
- L/L: left signal on both ears ;
- R/R: right signal on both ears ;
- L+R : mono sum (L+R) on both ears;
  (useful for mono compatibility and phase coherence checking)
- M+S : M+S sum (normally left signal) on both ears ;
- M-S : M-S sum (normally right signal) on both ears ;

- M/S: listening of encoded signals (sum and difference)

The L/R↔M/S matrixing is used for example to listen a conventional stereo signal (L/R) when monitoring M/S microphones, or when monitoring outputs that have been M/S encoded.

- Alternatively, when the mixer is operated in normal stereo mode, encoding the signals for monitoring can be used to check the stereo correlation, by comparing the relative amplitude of the M and S signals

2.4. Internal alignment signal generator

An integrated double oscillator can deliver a sinusoidal 1 kHz on the left and a 400Hz on the right to outputs. This can be used to align analog equipment connected to these outputs. This signal is activated on all outputs (analog and digital).

The peak level of the generator is **-18dBFS** (EBU digital reference level) by default but can be adjusted by menu from (-20dBFs to 0dBFS).

A function key can be set to have a direct access to the

2.5. Intercom / Slate microphone

A microphone is integrated in 4MINX's front panel; its amplified signal can be inserted into the analog/digital outputs (replacing the normal audio signals). See audio routing, Slate.

A function key can be set to have a direct access to the feature.

3. Powering

3.1. Specifications

4MINX operates from Li-Ion DV battery type NPF-9x0. The integrated charger can recharge it from an external DC supply in less than 7 hours (depending of the battery capability).

The DC/Bat LED becomes red to show the proper operation of the internal charger. This LED becomes green at the end of the charge. If you don't want to charge the battery, you should use a dedicated power cable without connection on the Charger dc input pin (See connectors paragraphs), which may be desirable e.g. if the external source is itself derived from a battery pack.

4MINX can operate from an external source of **8 V to 18 V DC** voltage. 4MINX draws *constant power* from the external source when the voltage changes. 10V minimum is need for charging.

The same LED becomes green to indicate the presence of the external power source. 4MINX switches automatically between its internal battery and the external source, without any noise (priority is given to the external source when it is available!)

The low battery level can be adjusted by menu from 6,9v to 7,3v. When this threshold is reached, a warning message is display on the screen and the battery icon is set in red.

Whenever the battery voltage goes down to 6.9 V, 4MINX is automatically shut off. This prevents damaging the battery by discharging it too deeply.

4MINX's power consumption and hence its battery range depend much on the operating conditions, such as the number and powering mode of the microphones, headphone impedance and listening level, etc.

However, as an example, starting with a full charged battery, 4MINX will operate for at least 7 hours (Sony NP-F970) with dynamic microphones (including ribbon microphones) and a 600 Ω headphone. In such condition, 4MINX draws less than 500mA from a 14.4V external source.

4MINX draws a near-constant *power* (not a constant current) from the external source when the voltage varies

3.2. Switching on and off

Hold down the “Esc” button for more than 2 seconds; the screen will light up and display the AAS logo after few seconds and after the application start.

To switch off the unit, you can go in the menu tools and select power down. Or you can press “Esc” during 2s, and press F1 to confirm. Like that, you will preserve the integrity of the systems and limits the risks to have defective audio files.

Note: It is possible to switch off the unit by holding down the “Esc” button for more than 10 seconds. This should be use only for emergy used.

4. Menu description

4.1. General principles

To enter the menus, push (just shortly this time!) the “Esc” button. The main menu is then displayed. Pressing again the “Esc” button brings you back to the normal meter display mode

You can navigate inside the menus and across lists using the rotary.

To change an item, first move towards it using the rotary until the item is highlighted; then select the item by pressing the “OK” button or push down the rotary. Change the selected item or value using the rotary, and press again the “OK” button to confirm the change.

Press the “Shift” button to leave a menu from one level

Press the “Esc” button to leave a menu; repeat the press to return to the normal meter screen

In some case, F1 to F4 keys can be used as function key

On the main menu level, many quick accesses are defined. They give you a direct access on some settings:

- For Audio menu:
  - Micro/line input configuration status
  - Line input configuration status
  - AES input configuration status
- For Records menu
  - File management
- For Settings menu
  - Load snapshots
  - Bargraphs configurations

4.2. Menu structure

The menu is divided in 4 sections

- Audio configuration with
  - « Audio input » : Analog and digital inputs settings
  - « Audio Output » : Analog outputs settings
  - « Coupling » : analog input coupling between input 1 to 4
  - « Routing » : Output routing & bus mixing
  - « P1-P4 » : P1 to P4 potentiometers function
  - « Master » : Master gain level
  - « Mixdown limiter» : Limiter/Compressor configuration

- Recordings
  - « Project management » : To create, delete and modifie a project
  - « File management » : Configuration of recorded files
  - « Filename template » : template of recorded files
  - « Meta Data » : Management and entry of medata for BWF files
  - « Backup to USB »: Enable the backup of the current working day on an USB disk.
  - « Settings »
    - « File format » : Configuration of number of bites in the files

- « Pre-record » : pre record time configuration
- « Backup false take » : Enable false take backup
- “Pause function”: Enable pause during record or not
- “REC key security”: Enable double REC key press to start recording

- Settings
  - « Synchronization » :to set synchronization source and the sample rate frequency
  - « Tone generator » : Adjust the tone generator level
  - « Time code » : Set all time code configuration: mode and video rate
  - «Snapshots« : Manage snapshots (user memories)
  - « Display settings » :
    - Configuration of bargraphs and brightness adjustment
    - Adjust the font size for menu
  - « Function keys » : Assign feature on assignable F1 to F4 key
  - «Recording BIP» : Enable/disable BIP on record start and stop
  - « Date » : To change the system date
  - « Time » : To change the system hour
  - « Keyboard auto lock » : Automatic lock of the - and + keys after 10s
  - « USB keyboard » : keyboard language selection

- Tools
  - « Power down » : to switch off the unit
  - « Sleep» : to put the 4Minx in Sleeping mode
  - « Eject media »: Unmount SD card and USB disk before removing it from its holster. NEEDED TO AVOID PROBLEMS
  - « Format media » : to format the SD card
  - « Reset settings » : Load factory configuration

- « Import » : Load settings and projects form the SD card
- « Export » : Export settings and projects to the SD card
- « Warning Threshold» : Set threshold warning level of the battery, the external DC level and the disk space
- « Update firmware » : update the firmware from the SD card

- About
  - Show system information : version, configuration, IP address
- Shortcut list : Show shortcut key features

4.3. Menu : « Audio »

4.3.1. Menu : « Audio Inputs »

- For each microphone 1 to 4
  - The microphone gain can be set from 0 to +50dB by 10dB step
  - An analog filter at 50Hz 18dB/Octave can be enable
  - Digital filter at 50Hz to 200Hz 18dB/Octave and 30Hz/6dB/Octave can be enable
  - A limiter can be enable
  - A 48Volts phantom power can be enable or a Tonader 12V.
  - The phases can be inverted
  - Specific settings for microphone input 1 and 2: An 20dB attenuator (PAD) can be enable.
  - Specific settings for microphone input 3 and 4 : The input connectors can be switch from standard XLR 3 pin to the MiniCon 12 pins

- For the line inputs (1 and 2)
  - The maximum level can be set between -9dBu and +22dBu
  - Digital filter at 50Hz to 200Hz 18dB/Octave and 30Hz/6dB/Octave can be enable

- For each AES inputs (1&2 and 3&4)

- 10V phantom poser can be enable (AES42 normalization)
- A fixed gain can be set between 0dB to 36dB by 6dB steps
- Digital filter at 50Hz to 200Hz 18dB/Octave and 30Hz/6dB/Octave can be enable

- « Delays » : Add delay from 0 to 7ms by 0.1ms step on each input (all Analog and digital inputs). The new delay selection is applied immediately after its selection by OK. The value enter by the user is the delay of the external unit connected on the input. ie the latency on this input is equal to the maximum latency request on all inputs minus the value enter on this input.

  The same delay is applied on microphone pre and post fader. We don't take in care microphone coupling. The user should set it manually for each input. All values are saved in snapshots.

- « Limiter Threshold » : Adjust the microphone limiter threshold between -3dBFs to -12dBFs, -6dB is the minimum value to accept the full dynamic input range.

4.3.2. Menu : « Audio Output »

- For each line from 1 to 4
  - The maximum output level can be set between -9dBu to +22dBu
  - A 40dB attenuator can be added.

- For each Extended outputs on I/O connector (MiniCon)
  - The maximum output level can be set between -20dBu to +10dBu
  - « AES out mode » : AES format : « Pro » or « Consumer »

4.3.3. Menu : « Coupling »

In this menu you can select microphone coupling between:

- For 2 inputs: Stereo or M/S coupling on inputs 1&2 or 3&4
- For 3 inputs: Double M/S, inputs 1&2&3
- For 4 inputs:
  - Link between 1-2-3-4
  - SoundField A for SPS200 (option soundfield)
  - B format (option soundfield)
  -

By default there are no couplings.

4.3.4. Menu: « Routing »

Mixdown bus

Under this menu, we can set inputs sources mixing together in the stereo bus (Mix down) You can manage correctly mono and stereo sources in this bus.

Auxiliary bus

You have a second mixing bus for local diffusion. You can send it on analog and digital outputs. Only mono source can be managed correctly in this bus

The master has no effect on the auxiliary bus. An automatic attenuation is made depending of the number of selected sources.

Number of channels mixed into AUX bus	Attenuation
1	0dB
2	-6.6dB
3	-10dB
4	-12dB
5 & 6	-14.4dB
More	-17dB

Monitoring bus

You have a third mixing bus for monitoring CUE. You can send it on analog and digital outputs. Only mono source can be managed correctly in this bus

The master has no effect on the monitoring bus. There are no automatic attenuation.

Output sources

For each analog and digital output you can select one of any inputs, mixing bus, monitor or play back sources

Slate

Last point, you can specify on witch outputs the slate will be send. You can send also it in the mixdown, auxiliary bus and in all recorded tracks.

Note: the slate replace the original routing on all programmed destination

4.3.5. Menu : « P1-P4 function »

Under this menu, you can assign many features on the P1 to P4 potentiometers

1. You can have a panpot feature on the microphone input 1 to 4. When you select this feature, the selected input is automatically routed in the mix down with panpot. When you disable it, the selected input is routed in L&R in the mix down.
2. You can configure a gain adjustment on the input line 1 & 2, both can be coupled on a single potentiometer or separated on 2 potentiometers. The line input accepts a maximum level of + 24dBu and gain adjustment covers a range of + 15dB to-90dB
3. You can configure a gain adjustment on the AES input 1&2 or 3&4. Each couple can be coupled on a single potentiometer or separated on 2 potentiometers. The gain adjustment covers a range of + 15dB to-90dB.

4.3.6. MIDI Menu

Menu will allow you to transfer control of audio interfaces on a control surface.

4Minx support 2 control surfaces:

- Korg nanoKONTROL2
-

-

- Behringer BCF2000

Each of these surfaces can control 8 channels simultaneously. Channels, as on the 4Minx, can be coupled or not.

Example: Mic/line1&2 coupling

Channels 1 to 4 control mic / line 1 to 4 inputs; channels 5 & 6 control line inputs and finally channels 7 & 8 control AES 1 & 2 inputs.

For each channel you disposed of two actuators: a linear fader and a rotary encoder. The encoder is primarily to adjust the input sensitivity.

For more information on management, see chapter management couplings

Some keys are also used on the midi control surface:

- REC: press twice to record. The pause is also available if the feature is enabled in the menu.

- STOP: press twice to stop recording

4.3.7. Menu « Master gain»

You can enabled or disable the front panel master potentiometer with this menu. The master affect only the mixdown (main BUS)

For the fixed choice, you can set its gain between -12dB and +12dB by 1dB step

For variable choice (potentiometer enable), you can specify the maximum gain available at full clock (0dB to 9+18dB)

4.3.8. Menu « Mixdown Limiter»

Under this menu, you can enable or disable a limiter and/or a compressor on the mixdown.

The user can adjust many parameters. At first you should set the limiter threshold (Adjustable from -2dBFS to -20dbFS), after that the compressor threshold (adjustable from -40dBFS to the limiter threshold) and last parameter, the compression of the compressor (Disable to 1:6).

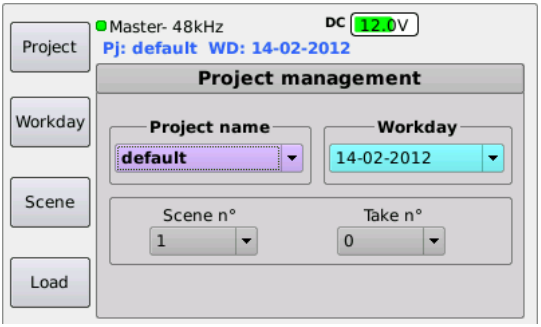
To simplify the configuration, we have defined 3 profiles for the reactivity of the limiter / compressor: Slow, normal and fast

4.4. Menu : « Recording »

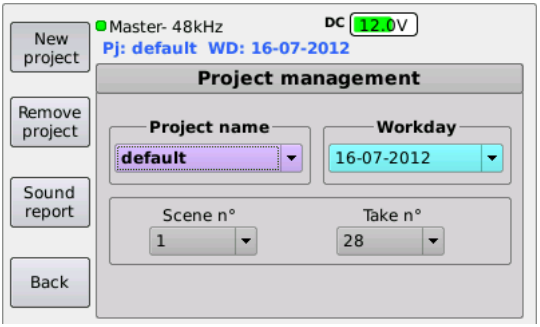
This menu allows you to manage records on a shoot. Each shooting can be associated with a project, in the project you can create work days. These work days can follow or not calendar days.
At each new record, the take counter is automatically increased.
If you want to split into "subgroup" records, can select different scenes. In contrast to the "take", there is no auto-incrementing

4.4.1. Menu: « Project Management »

This menu allows you to manage your projects. We have 3 parts, the first to manage projects, the second to manage working days and the last to manage scenes. Access to the different parties is making through the function keys. Via the main interface, below, you can change project and working day. The validation of a project is necessary to enable it. The validation is done through the function F4 key



1. Project management

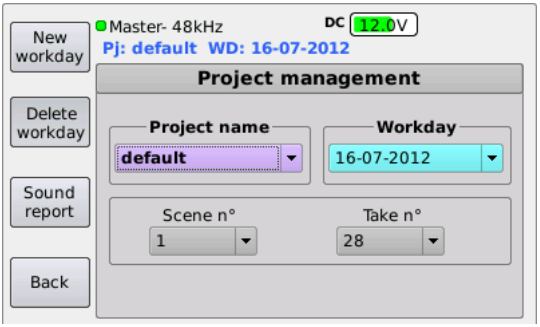


-
- This module allows to create a new project, the work day will be the day of the machine (date system)
- You can destroy a project. But to destroy the current project, it is necessary to select another project before. Only information related to the project is destroyed but not audio files are destroyed.
- You can generate a report of the complete project in HTML and CSV format on SD card trough the Sound report menu

4MINX Report															
Machine: my 4MinX				User: My name					Version AAS: 1.5 21/03/2012						
Project : my_project															
WORKDAY'S : 21-03-2012															
Filename	Scene	Scene	Take	StartTC	Duration	Circled	F1	F2	F3	F4	F5	F6	F7	F8	Date
-1_1_xx	first_scene	1	1	06:12:03	00:00:09	FALSE	[1]BUS L,[2]BUS R	[1]boom	[1]Post 3	[1]MIXY L,[2]MIXY R,[3]mic AES42 n1,[4]mic AES42 n2					2012/03/21 13:57:56
Note:	My note														
-1_2_xx	first_scene	1	2	06:12:47	00:00:06	TRUE	[1]BUS L,[2]BUS R	[1]boom	[1]Post 3	[1]MIXY L,[2]MIXY R,[3]mic AES42 n1,[4]mic AES42 n2					2012/03/21 13:58:22
Note:	My note														
-1_3_xx	first_scene	1	3	06:13:06	00:00:14	FALSE	[1]BUS L,[2]BUS R	[1]boom	[1]Post 3	[1]MIXY L,[2]MIXY R,[3]mic AES42 n1,[4]mic AES42 n2					2012/03/21 13:58:50
Note:	My note														

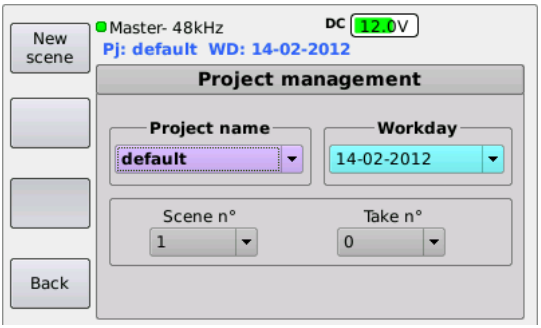
Note: If canvas index is use, Scene field are replaced by sequence/scene from the canvas and we show take number from canvas.

2. Workday management



- This module allows creating a new work day with the date system
- You can destroy a workday.
WARNING: Only AUDIO files of this day will be destroyed, we keep all takes information. It is the only way to destroy audio files.
- Can generate a report of the day's work in HTML and CSV format on SD card via the Sound report menu.

3. Scene management



You can create a new scene in the project when you want. The scene index is not related to working days. It increments regardless

For all modules, the navigation between the different drop-down lists is done through the encoder as in menus. The activation of the Ok allows entering and getting out of the various fields. The Esc key cancels any changes.

4.4.2. Menu : « File Management

In this menu, you can configure your records. This configuration is linked to the active project.
We work by file. Each file can be either Mono or well polyphonic (several mono tracks in the same file). In case of use coupling microphone, you can specify Stereo, M/S, Double M/S, A or B format (Option soundfield)
e

You should respect the track order in these files:

- For stereo files
  - Track 1 : Left or Mix-L for a bus
  - Track 2 : Right or Mix-R for a bus
- For M/S files
  - Track 1 : Middle
  - Track 2 : Side

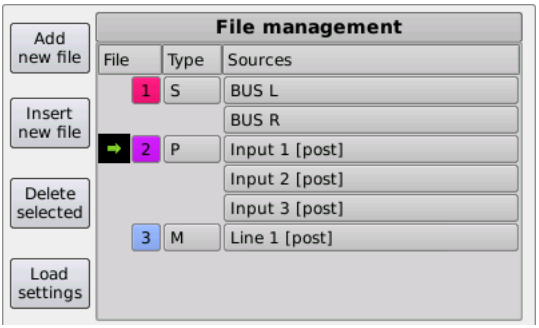
- Double M/S files
    - Track 1 : Middle front
    - Track 2 : Side
    - Track 3 : Middle rear
- For B format files
    - Track 1 : W soundfield
    - Track 2 : X soundfield
    - Track 3 : Y soundfield
    - Track 4 : Z soundfield
- For A format files
    - Track 1 : LF-A_FORMAT
    - Track 2 : RF-A_FORMAT
    - Track 3 : LB-A_FORMAT
    - Track 4 : RB-A_FORMAT

This configuration doesn't affect the routing; file type information is use for meta data. Like that, the post product can identify easily what microphone was used.

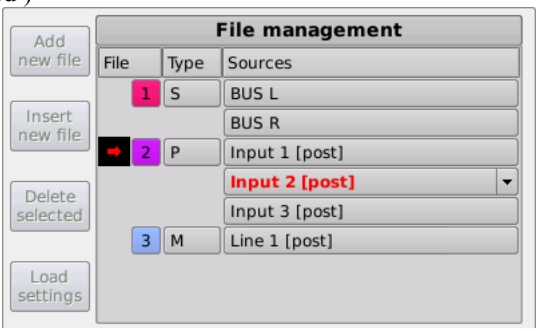
The files are WAV files with the extension BWF and iXML fields. This type of file remaining fully compatible with a standard WAV file.
For each file, you can select the sources. The number of selectable sources depends on the number of tracks "authorized" on your machine (see "About" menu)
To create or destroy files, you have at your disposal the function keys. Once your configuration is performed, it must validate it with the F4 key

.

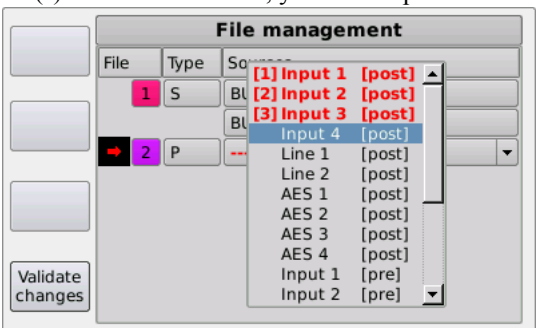
This is the new file management interface. Now, you can insert, delete or add a file where you want. Each source in each file is showed like that.



If you select a file by Ok, you can change the type. You can change all or only one source. You should use the rotary do go on the field whose be modify (displayed in red)

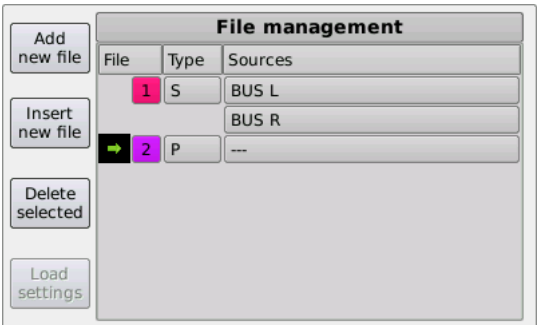


To validate source(s) of the selected file, you should press **F4 or SHIFT.**



Or press Esc to cancel modification.

If the file is not valide, you have a '---' in the sources field.



4.4.3. Menu : « Filename template »

Through this menu, you can change the root of the file name. You have at your disposal 3 fields. For each field, you can select between:

- the project name
- Scene name
- Working day
- Recording type
- Canvas

The file will have the following name:
[Field 1]_[Field 2]_[Field 3]-[scene index]_[Take index]_[File number]-[Split file index].wav

Note: the [Split file index] is the index of the 2Go file split (FAT limitation size)

4.4.4. Menu : « Meta data »

In this menu you can enter a name for the current scene, notes on the current scene, put a machine name in the sound report and also enter a user name.

Meta data are saved in each audio file and can be re-used in post production (See iXML annex).They are included also in the sound report of the working day or project report.

Edition interface

To entry data you have two possibilities:

- Use an external USB keyboard. 4MinX support every kind of USB keyboard, wire or wireless. You can specify in the 4MinX 3 keyboard types: UK, French and German. Some specifics characters aren't take in care to stay compatible with the FAT system file.

- Use the virtual keyboard
    - The letter selection is made via the encoder
    - The validation of the letter is made via the OK button.
    - The position of the cursor can be set with and .
    - The Stop key inserts a space in the text
    - The Shift key switch between miniscule and majuscule
    - F2 key erase the last characters
    - F3 key erase the field
    - F4 key validate the entry

Scene name edition

Automatic note

When the "Automatic note" option is enabled, at the end of each recording, the note entry appears. This allows modifying quickly the note between each takes. You can at the same time mark your scene as good via the F1 key ("circled").

Circle
Del
Clear
Enter
Master- 48kHz
DC 11.9V
Take Note:
My notes for this scene
0 1 2 3 4 5 6 7 8 9 . - _
A B C D E F G H I J K L M
N O P Q R S T U V W X Y Z
space

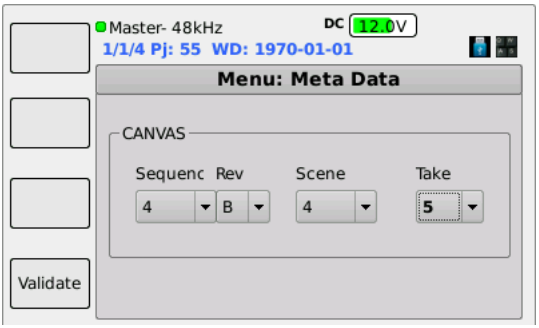
Recording type

You can specify the nature of the record via the menu "Recording type". This information can be used in the name of the file. You have the choice between:

- Wild Sound
- Pick up
- Announce
- Time Sync
- Not specify
- Ignore

Canvas

For people working with 3 indexes, a canvas is available in this menu too. The canvas has the following format: sequence number + letter-scene-take. The canvas is automatically incremented at each new take and it is resetting on a new scene creation. The canvas can be used also in one field of the recording file name and only in that



You can modify the all fields. You should set the focus on the wanted field, press Ok and increase or decrease the value with the encoder. And press Ok again to validate.
All field value will be taken in care for the next record. Pres F4 to validate modification or ESC to cancel.
After each new take, the Take index is automatically increased.

Sources names

You can specify a name for each inputs, this name will be show in the sound report and can be read form the audio file in post production to identify easily sources. These labels are save in the snapshots.

4.4.5. Menu : « File format »

You can specify the number of bits of the BWF file, 16-bit or 24-bit files in this menu

4.4.6. Menu : « Pre-record »

4minX supports up to 10s of pre-record, based on the number of tracks and sampling frequency. Pre record is automatic reset on each configuration change. The total duration of your records will be increased by the value of the selected pre-record.

The pre-record is working as soon as you enable it in the menu, you don't need to be in a special mode for having it. You have programmed pre-record buffer available at any time.

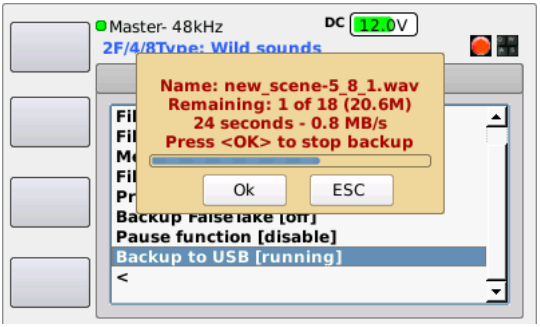
4.4.7. Menu : « Backup False take »

If you enable this function, false take will be saved in a "trash" sub directory of the project. The files keep the same name indexed by a '_x'. If you make several consecutive false take on the same index, we add an another '_x' on older files

To mark a take as a false take, you should use the shortcut: “Stop” +

4.4.8. Menu « Backup to USB »

If you connect a memory key or an external hard drive on the USB port, you have the opportunity to make a backup of audio files of the current day. The transfer is done in background. You can stop the transfer and resume at a later date, where you are.
At any time you can check the backup statue via this menu



The State of the "backup" is shown by icon in the main window instead of the external USB drive icon .

- Symbol red round: backup running
- Symbol red pause: backup in pause
- Symbol yellow exclamation Point: problem,
- Symbol green round: synchronization made

Note: It is strongly recommended to use the high speed USB connector (micro USB) to reduce the transfer time.

.

When the backup is stopped, an update of the sound report of the current working day is made on the USB disk and on the SDCARD.

4.5. Menu « Settings »

4.5.1. Menu : « Synchronization »

In the "Mode" menu, you can choose the mode "Master" (operation on the internal clock) or select an external sync mode: AES or a word clock (Time code Option)

In the "Frequency" menu, you can select the sampling rate frequency from 32kHz to 96 kHz

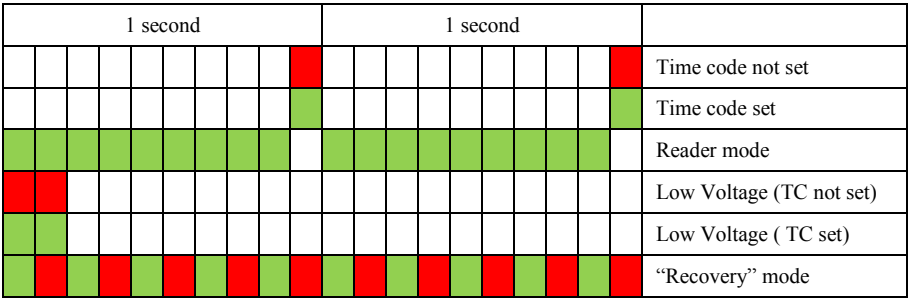
Note: It is imperative to select same sampling rate as the external source of synchronization for the proper functioning of the machine.

4.5.2. Menu : Time Code (Option)

In this menu you can set the Time Code mode of operation:
- Off: all the records begin to 0h0m0s
-Free Run: Time code runs independently on its current value
-Ext TC: 4MinX following continuously an external code, including judgment time
-Ext Tc / cont: 4MinX synchronizes to an external TC and continues to run the TC even if the source is disconnected.
-
You also have the option to configure video format which is associated with: 23.976, 24, 25, 29.97, 30, 29.97 drop or 30 drop frames per second.

Set Time Code menu specify its value for the "free run" mode or when 4MinX is used as a generator of time code. You can reset it to 0h:0m:0s, use the current hour or set it as you want. An adaptation of LEMO5points to two sheets BNC cable is available as an option.

Led bicolor on the right side of the 4minX gives you the State of the Time Code module configuration



NOTE: The Time code is maintained during 3 hours with dedicated internal batteries if you set it in EXT TC/CONT or Free Run

Note: The Time code charger works only when 4MinX is powered

4.5.3. Menu : « Snapshots »

You can create configurations memories. All configurations related to audio part and audio files will be stored in each memory.
You can create, delete, load, export and import them.

4.5.4. Menu : « Tone »

Allows adjusting the level of the tone generator between -20dBFs to 0dBFs

4.5.5. Menu : « Display »

The menu "Brightness" allows both adjust the brightness of the screen and all of DEL present in the face before.

The "Metering thresholds" menu allows setting the threshold for each LED of the bargraph. These same settings are used for the display of the levels on the TFT screen.
The "Bargraph mode" menu offers you the possibility to change the display mode of the audio levels on the screen between VU mode and dBFS mode.
In VU mode, the 0dB level corresponds to the threshold of the yellow led.

The "Bargraph count" menu allows you to benefit of 4 additional bargaphs in mode "full". 4 Additional bargraphs are blue instead of green.

The « Bargraph display » menu allows you to select between 2 mode the bargraphs sources ; The ‘Tracks’ mode follow file/tracks configuration and teh ‘User’ take in care selection made on “Bargraph sources" menu.

The "Bargraph sources" menu offers you the possibility to customize the sources of 8 bargraphs on the screen.
Note: the 4 mic/line inputs bargaphs led show the post fader level (cannot be changed)

4.5.6. Menu : Function keys

This menu allows you to configure function keys for the “recording” mode.
You can assign 2 functions by touch, through the use of the "shift" key before pressing the function key.

Here is a list of the available functions:

- For mic/line inputs

- Gain, filters, phase, Limiter, solo
- Meta data
  - Note
  - Scene name
  - Type of take
  - Canvas
- Memories
  - Snapshot from 1 to 8
- Other functions
  - Slate, Tone,…

4.6. Menu : « Tools »

4.6.1. Menu : Power down

It is imperative to power down the 4MinX correctly from the user interface if you don't want to lose settings and configurations.
You can press during 1s the ESC key in place to use this menu and confirm by F4

4.6.2. Menu : Sleep

This menu allows putting the 4Minx in standby. In standby, the consumption is reduced to 1.5W. All microphones power are cut and the 9V for the wireless transceivers and receiver is turn off.
By pressing Esc key you return to the normal operating mode in 3s
You can press during 1s the ESC key in place to use this menu too and confirm by F1

Note : The backup job will continue in this mode. DON'T DISCONNECT THE USB DISK WHEN YOU ARE IN SLEEP MODE

4.6.3. Menu : Eject media

TO AVOID ANY PROBLEM WITH THE FILE TABLE ON THE SD CARD OR ON USB DISK, IT IS IMPERATIVE TO PASS THROUGH THIS MENU BEFORE REMOUVING THE DISK OF ITS HOSTER

4.6.4. Menu : Reset settings

This action will destroy all configurations registered in the machine.
You can also, via this menu, return to the "factory configuration".

Note: restart requested after this action!
Note: The audio files in the memory card are not destroyed!

4.6.5. Menu : Import/export configurations

With these two menus, you can import/export your projects and your configuration of machine from/on the SD card.

Project

You can export or import all projects from one 4Minx to another one. If a project still existing on the unit, we import only new takes information. Other project settings are kept (like file configuration, meta data..).

Note: no projects are deleted when you make an import

Settings

A reboot of the machine is necessary after importing a configuration.

Debug

Via the export menu/debug, you can retrieve all the information relevant to analyze problems on the SD card directory

4.6.6. Menu : Format media

Through it sub-menu, you can format your SD card or an USB Storage with FAT32 file system.

You can do a quick format on the first partition used by 4MinX by F1 or make a whole disk (complete disk) format by F4 button. In the latter case, all existing partitions on the disk will be destroyed and it will be formatted with one partition under FAT32 format.

Formatting will take less than a minute for a complete disk format.

CAUTION: All data on the disk will be lost!

4.6.7. Warning

You have 3 sub menu to set warning threshold:

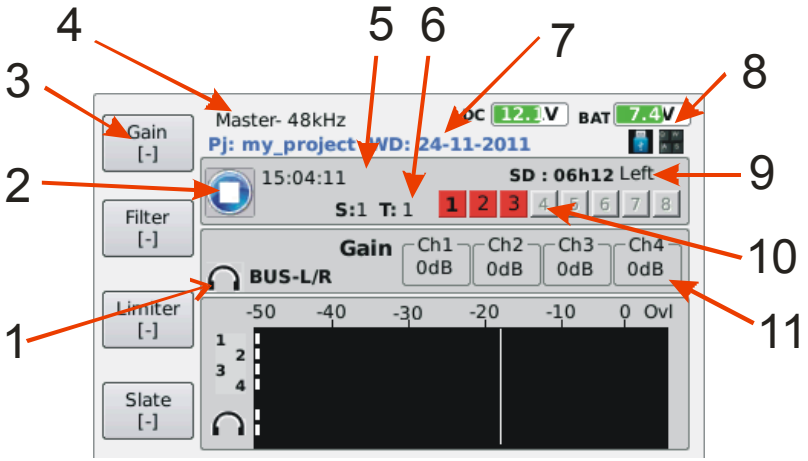
- Warning threshold for the NP-F battery, the minimum value is 6,4V
- Warning threshold for the external DC power
- Warning threshold for remaining SD card disk space.

4.6.8. Update

Check on the SD card an update file and launch the update if it is found

5. Operating mode – Detailed description

5.1. Interface



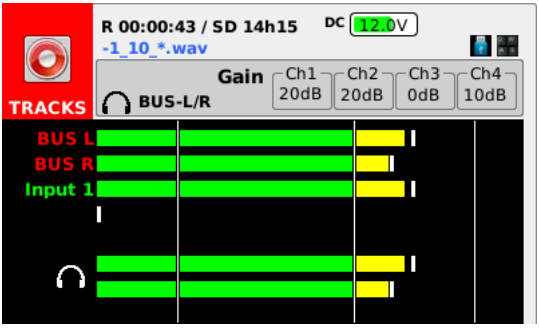
1 : Show monitoring source and listening mode
2 : Recorder state : Stop, Recording, Pause, play
3 : Function keys : show the name of the function on the first line and in [], the second function accessible with the shift key
4 : Synchronization and sample rate frequency indication.
5 : Time Code or system hour
6 : Last recorded scene and take index.
7 : Project name and work day
8 : USB disk icon and USB keyboard icon
9 : SD/SFHC card information
10 : Files/tracks status
11 : 4 mic/line configuration status for the selection function key (ie : microphone). Chx change to blue when 48V is selected and change to red for T12.

5.2. Start a record

To record, a project must be validate (by default "default" project), and having a configuration files valid (by default “Mix down”). This information must be available on the work screen (above: point 7 and 10).

To start a recording, you should press "REC" key. The first pressure, the recorder is set to "READY", and it waiting for a confirmation by a second "REC" press if you have enable the security.

The screen automatically switches to recording mode with large bargraphs. The first panel shows your TRACKs level with there’s configuration, armed in red or not armed in green.
If you press OK, you can see the USER configuration bargraphs. You can switch at any time between this screen and the standby screen by pressing the encoder or the OK button.



On this screen you can see the true name of file for your next record.

The function keys are still here. They appear on first press and become active. You should press again it to make an action. They disappear after 5seconds

The Background color provides a clear view of the recorder state.

ORANGE : Waiting record confirmation by pressing REC key

RED : Record running

BLUE : Pause during record

The record can be put in pause, by a "REC" press and resume by another “REC” press, if this feature is enable in the recording menu.

Recording is stopped by a double "STOP" press.

The current time or time code and recording time are refreshed every second. There is also the duration available on the SDCARD, ensuring that the remaining disk space is sufficient.

The bargraph name is set in red if the source is armed else in green.

5.3. Play a take

A short “Play” key press show the player module screen.

5.3.1. Navigation

You can browse between take in the current scene via the F1 and F2 function keys. You can see on the display, the current reading position and the total duration or final Time code of the file. The progress bar allows you to follow the temporal evolution of reading. To coming back in record, you get out of the reading module via the F4 key

5.3.2. Play

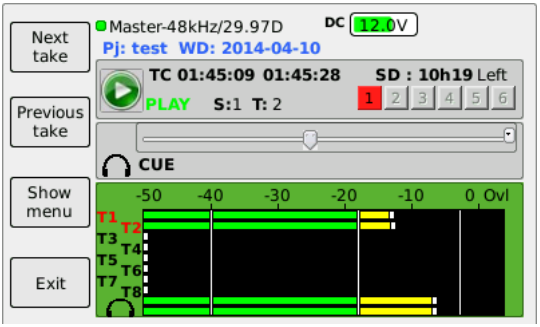
To start reading, you should press again the play key. The "pause" is accessible by pressing the same key. The advance and return keys allow to reposition in the file with a step of 5 s or / and 1 minute if the "shift" key is enabled.

5.3.3. Monitoring

Only registered sources will appear in the monitoring. Shortcuts are created automatically with the recorded file types. Bargraphs on the screen display the levels of all recorded channels. If the current monitoring isn't compatible with this take, we set the monitoring on the Mix down in L/R mode. The player has its own monitoring configuration. It doesn't affect the recorder monitoring configuration.

5.3.4. Mix, Cue bus.

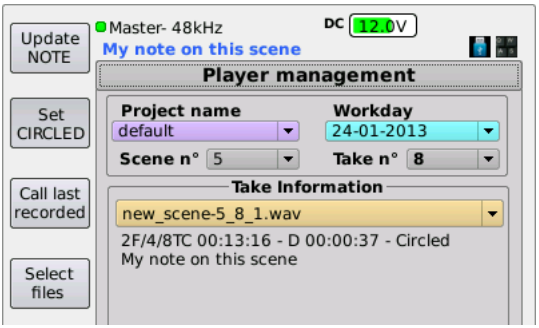
Solo feature is added for track 1 to 8 under the player. The 8 + and – keys enable or disable (flip/flop mode) the track routing in the monitoring under the player. The mic1 – key set the track 1 and the last mic4 + key set the track 8. The CUE bus is use for this feature. Selected tracks are sending into both CUE bus channel, it is a mono mix, and the "Tx" label is set in red.



Note:
- We keep the "solo routing" enable when the user change the current take by another one.
- The user should disable all solo or select another monitoring preset to disable it.

5.3.5. Search or modify a take

If you want to replay another day of work and another project file, you can select it via the accessible menu by the F3 key.



It was under this module that you can mark the take as "good" or reset this tag , via the button "Set Circled". You can also change note linked to this take.

If files are available on the SD card, they appear in the field "Take Information" and the information provided from metadata information.

5.4. Shortcuts

To optimize the use of 4minx, some shortcuts are available:

Keys	Function
« Headphone »	Display monitoring shortcut or source list
« Headphone » twice	Display listening mode
« Stop » + « << »	False take Or Save the take as a wild sound. The current index isn't increased and the file(s) is tagged with "_w" in the workday directory.
« Stop » + « >>»	New scene
« Shift » + « OK »	To inhibit or activate the recording of a file. The navigation between files is made by the encoder and the switch between the two states by OK (red : recorded, green : set but not recorded)
« Shift » + « Esc »	Change the display information of the SDCARD state
« Shift » + « Fx »	Access to the second key function feature

5.5. Quick Screens/configurations

For having a global vision of the current configuration of your 4Minx, you have 4 screens where you can modify settings.
Theses screens are available at the root menu on F1 to F4 keys.

All screens have the same management concept. It is base on table where line can be selected by the rotary encoder. The selected line is set in red.

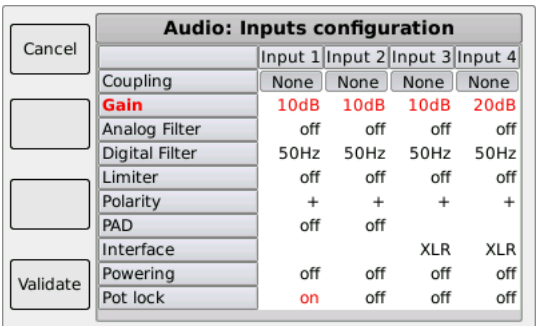
Settings of this line can be set by "+" and "-" keys from channel 1 to 4. You can have up to 4 columns on each screen. Each column is linked to the same channel number. The "+" key of the channel increase the associated setting, "-" key decrease setting. Modified settings appear in red.

To validate modifications, you can press "Ok" key to validate current line modifications or you can press F4 to validate all screen modifications.

All red modifications can be canceling at any time by Esc key

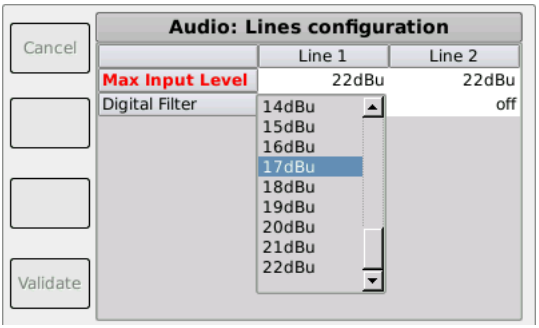
5.5.1. Inputs configuration

- *F1 : Microphone inputs configuration*


Audio: Inputs configuration
Cancel
Validate
Input 1 Input 2 Input 3 Input 4
Coupling None None None None
Gain 10dB 10dB 10dB 20dB
Analog Filter off off off off
Digital Filter 50Hz 50Hz 50Hz 50Hz
Limiter off off off off
Polarity + + + +
PAD off off
Interface XLR XLR
Powering off off off off
Pot lock on off off off

For example: To change gain, you should turn the encoder to see "Gain" in red. To change gain of the input x, you should press "+" or "-" key of the channel x

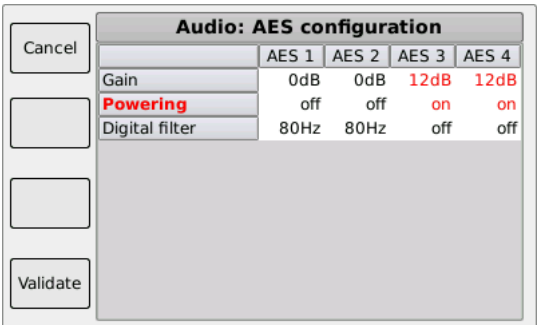
- *F2 : line input configuration*



With channel 1 "+"/"-" keys you can change Line 1 setting and with channel 2 setting of Line 2.

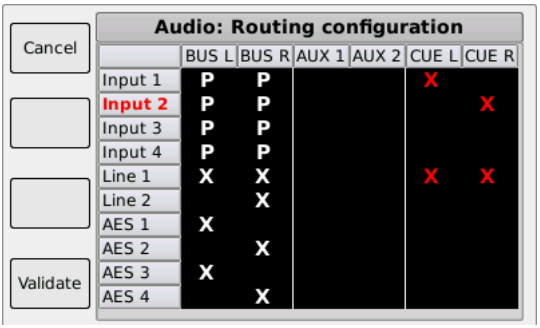
To speed of the selection, a combo list appears and the selection should be made with the encoder.

➢ *F3 : AES input configuration*



Here setting between AES1&2 and AES3&4 are linked together, then you can use both channel keys to adjust settings

5.5.2. Audio Routing



With this screen you can set mixed bus configuration.

Channel 1 “+”/”-“ keys change the selected input routing in the MIXDOWN bus.

The Channel 2“+”/”-“ keys change the selected input routing in the AUXILIARY Bus

The Channel 3“+”/”-“ keys change the selected input routing in the monitoring CUE Bus.

An “X” indicate routing configuration of this input in this BUS. If you have enable “pan pot” function, you can select it with “P” configuration

Coupling: When you enable M/S or Double M/S coupling, BUS routing of theses inputs aren’t take in care. They are always decoding to stereo and send in the mix down.

5.5.3. Audio lock potentiometers

Some potentiometers can be locked after adjustment: pan pot, stereo angle, balance. The lock feature is available in the “Audio Input screen”.

That’s possible if

- The input is set in mono and you have a pan pot : Lock the pan
- The input is set in stereo or M/S: Lock the stereo balance
-The input is a DMS: Lock the side balance and rear balance

Before unlocking a potentiometer, it is better to find the original position if you have changed by accident. The pop up window tells you the stored value try to match them.

5.6. Snapshots

A snapshot is a “picture” of the current configuration. It is an easy tool to save a working space quickly. A snapshot is backup of the current audio configuration, it save microphone choices and audio output configurations.
If you should coming back or you use frequently same microphone configuration, you don’t need to set manually all settings for this configuration. The snapshot aren’t linked to a project, you can use the same snapshot in any project.
One of typical use is to switch between ambiance and direct sound take, where you need to change yours microphones and change recording configuration.

Here the list of setting takes in care in a snapshot:

- Audio Inputs (excepted limiter threshold)
- Audio Input source name (label)
- Audio Outputs
- Channels coupling
- Routing (Excepted Slate)

- P1-P4 routing
- Recording : Audio Files configuration
- Monitoring presets

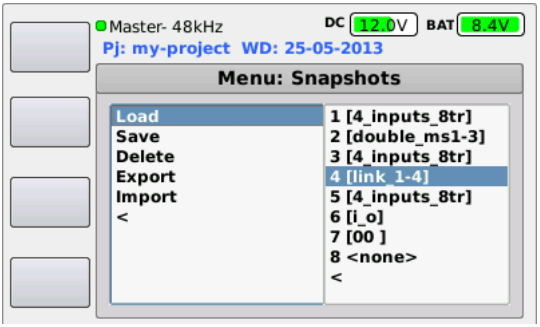
To manage snapshots, you have 5 items:

- Save : to modify or create a new snapshot
- Load : to charge a snapshot into the current configuration
- Delete: to remove a snapshot for the list
- Export : to save snapshot on the SDCARD
- Import : to load a snapshot from the SDCARD

5.6.1. Save / Load

To save a snapshot, you should go to the menu Settings /snapshots and select "Save". Snapshot list appears; you can select a free memory in this list or reused one entry. To identify easily a snapshot, you can name it through edition interface.

To modify it later, you should load it and save it again on the same memory.



To speed of the configuration load, you can assign snapshots to function keys. You have also a shortcut on F1 in the main menu when you select "Settings".

5.6.2. Export

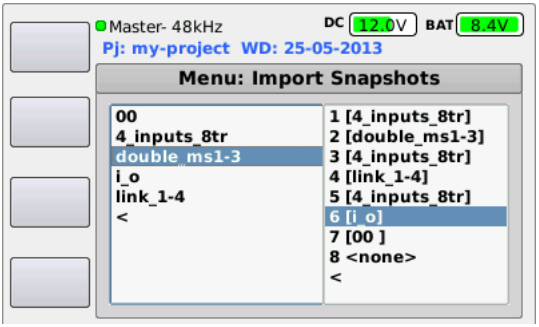
You can export a selected snapshot or all snapshots on the SDCARD. Each snapshot is saved in a dedicated file named with it assigned name. If the snapshot exists on the SDCARD, it will be replaced by the new one.

If you need more than 8 snapshots, you can save unnecessary snapshots on your SDCARD and reload them later.

Ex. Export “all Snapshots” on the SDCARD

5.6.3. Import

When you choice to import snapshots from your SDCARD, we show you all snapshots found on it under a list, you should select the wanted snapshot in the list and select after the place where you want to have it.



Ex : load the “double_ms1-3” snapshot in the memory 6

6. Audio couplings

6.1. Microphones

We can divide microphone type 3 parts, from simple to complex:

- Monophonic
- Stereophonic
- Surround

We won't explain microphone capture technique. We will just provide you details on about to set your 4MinX for each microphone used. Next chapter will explain how to manage microphones.

We provide details on compatible microphones with the 4minX. We don't speak about configuration needed more than 4 microphone inputs.

6.1.1. Monophonic

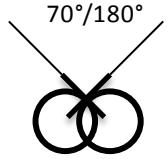
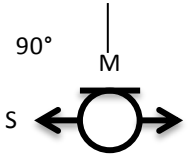
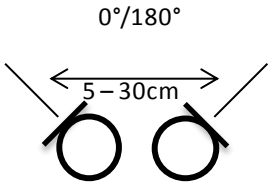
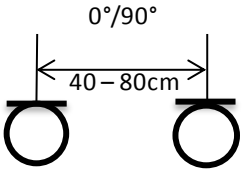
Monophonic microphones are the base. You can found different capsule on the market. Except their power, they are managed under the same way on the 4Minx. You should disable coupling on its input, you can manage its own gain and apply treatment on it.

After that, you can decide to mix it on not with others sources. Or you can send it where you want in the stereo mix down, on left, right or both sides with pan pot.

6.1.2. Stereophonic

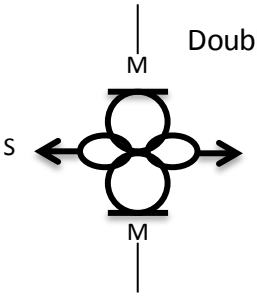
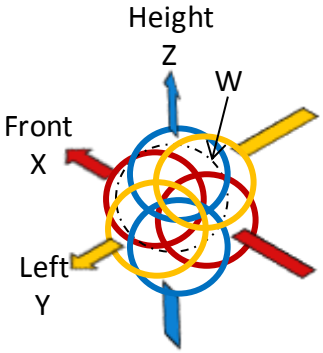
Theses microphones are used for stereo production (stereo mix down), all of them use 2 microphones. They can be coincident or not (some distance between).

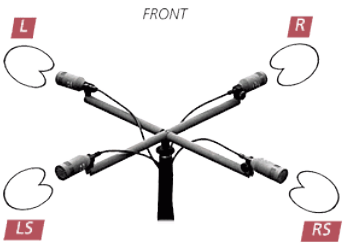
Same cardioids capsule should be use for each microphone, excepted for the M/S where you have a figure eight (bidirectional) for the Side.

 X/Y	Coupling stereo should be set	Spaciousness limited but good localization
 M/S	Coupling M/S should be set to decode it in stereo (A M/S decoder can be also enable on the monitoring)	Spaciousness limited but good localization
 ORTF	Coupling stereo should be set	Spaciousness sastisfactory and good localization
 A/B	Coupling stereo should be set	Spaciousness good but indistinct localization

6.1.3. Surround

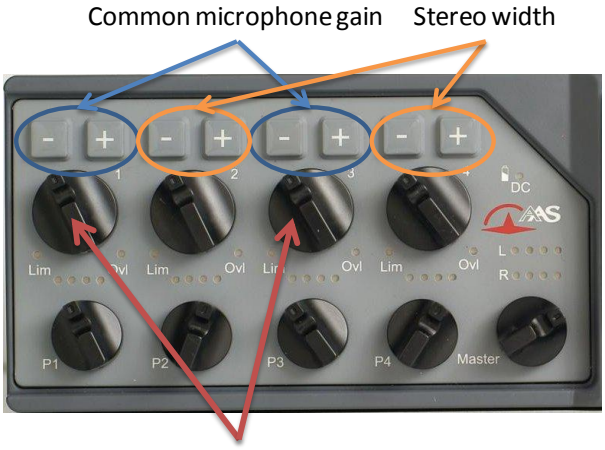
Surround microphones are recorded in native mode, but a decoder can be enabled for the monitoring on 4MinX

	Double M/S, 2 solutions: -With 3 microphones inputs : ➢ Coupling Double M/S should be selected - With 4 microphones inputs (Side split on 2 inputs) : ➢ Coupling M/S on 1&2 and 3&4
	SPS200 A-format Soundfield coupling should be selected for having A-format to stereo decoder. The decoder has effect only on the monitoring
	B Format coupling should be selected for having B-format to stereo decoder. The decoder has effect only on the monitoring

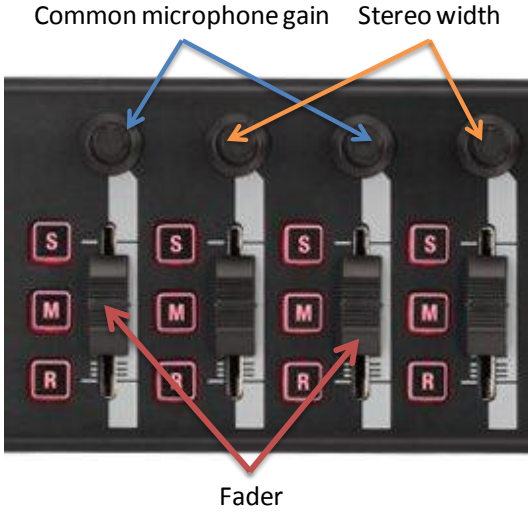
	IRT cross Link All 1-2-3-4 coupling should be enable It can be monitoring one by one capsule on the 4MinX
	Hamasaki square Link All 1-2-3-4 coupling should be enable It can be monitoring one by one capsule on the 4MinX
	….

6.2. Stereo coupling

In case of stereo coupling on input 1&2 and 3&3 on the 4MinX, you have:
Input 1: Left, Input 2: Right, Input 3: Left, Input 4: right



On the 4MinX :

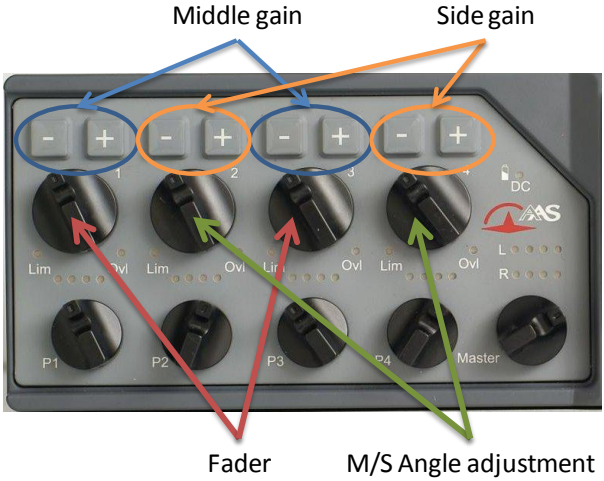


On a surface control :

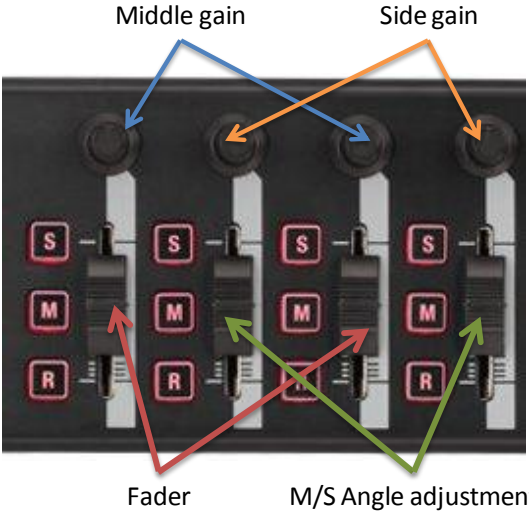
6.3. M/S coupling

In case of M/S coupling on input 1&2 and 3&3 on the 4MinX, you have
Input 1: Middle, Input 2: Side, Input 3: Middle, Input 4: Side

On the 4MinX :



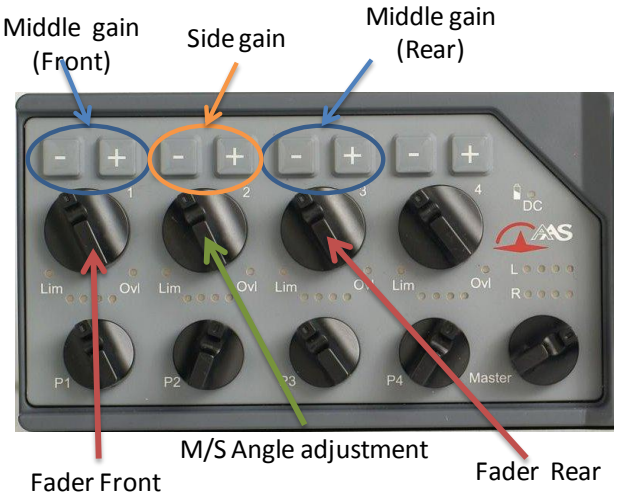
On a surface control :



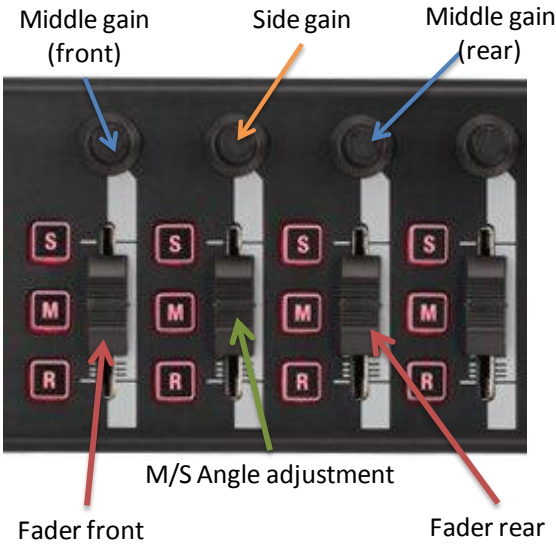
6.4. Double M/S coupling

In case of double M/S coupling on input 1&2&3 on the 4MinX, you have Input 1: Front **M**iddle, Input 2: **S**ide, Input 3: Rear **M**iddle

On the 4MinX :



On a surface control :



Note:

- The Side gain is a +/-6dB balance from middle front gain
- The Middle rear gain is a +/-6dB balance from middle front gain

In this mode only the front M/S is decoded in the mixdown. The 4MinX will give you a separated monitoring for the front and for the rear.

Note: The Double M/S microphone is mixed as 2 separated M/S microphones in the mix down after stereo conversion.

6.5. Link all 1 to 4

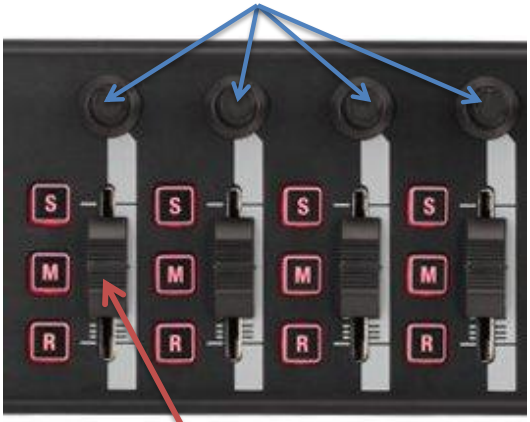
In case of Link all 1 on input 1&2&3&4 on the 4MinX, you have

Separated gain but filters & limiter are linked together

Common Fader for input 1 to 4

On the 4MinX :

Separated gain



Common Fader for input 1 to 4

On a surface control :

6.6. Soundfield A/B format (Optional)

A Format microphone

Input 1 : LF (Left Front), Input 2 : RF (Right Front), Input 3 : LB (Left Back), Input 4 : RB (Right Back)

B Format microphone

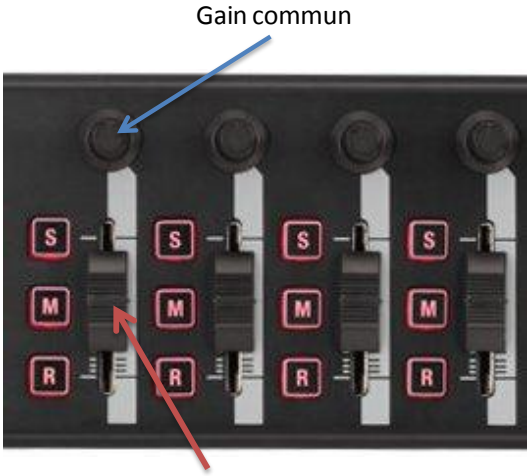
Input 1 : W (sound pressure), Input 2 : X (forward / backward), Input 3 : Y (left / right), Input 4 : Z (upward / downward)

Microphones Management

Gain, filters & limiter are linked together

Common Fader for input 1 to 4

On the 4MinX :

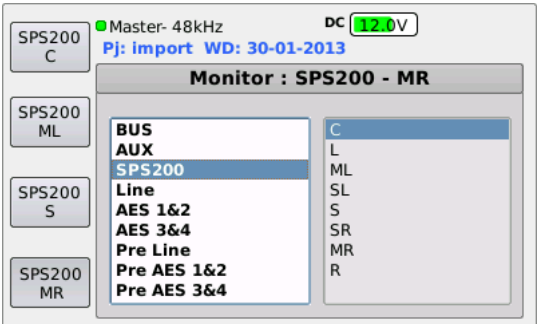


On a surface control :

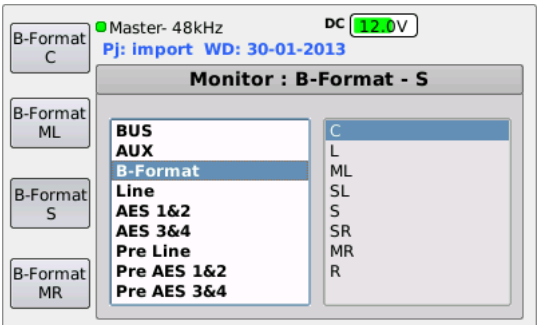
Monitoring

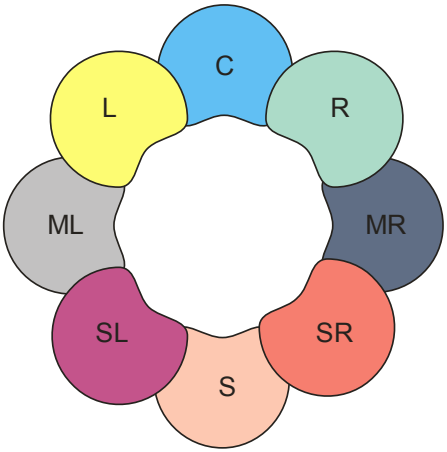
In this mode you can use a dedicated monitoring to decode the A or B format. You can turn around the microphone by 45° step. With this monitoring, you have the best monitoring as possible during your records.

Specific monitoring for the SOUNDFIELD A format (Microphone SPS200)

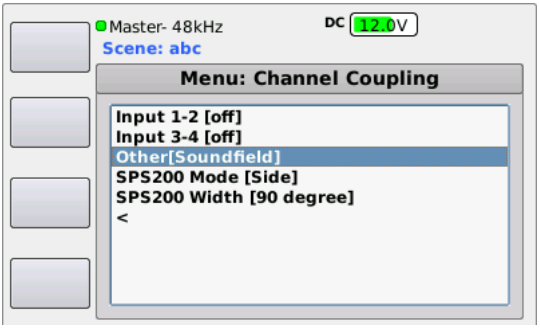
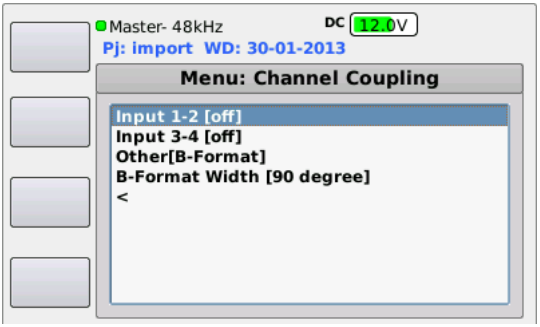


Specific monitoring for the B format

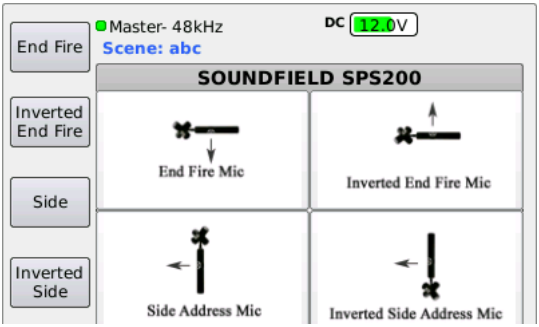




For having a good monitoring of the A or B format microphones, you should indicate in the Audio, Channel coupling menu the orientation of the microphone (for the SPS200) and the stereo width between 60° and 180°.

For the SPS200 – A format from SoundField	
For the B format	

Orientation choice for the SP200 microphone (Format A)



7. Technical Specifications

7.1. Microphone/Line inputs

Number	4
Format	Electronic symmetrical input
Socket	XLR3 Femelle, 3 points
Microphone powering modes	"Phantom", 48 V "Tonader" T12 V
Maximum input level (with "Pad" on input 1 and 2)	+39 dBu
Maximum input level (input 3 &4)	+19 dBu
Input headroom	40 dB
Input stage gain (menu setting)	0 to 50 dB, 10 dB steps
Equivalent input noise (EIN) (Gin = 50 dB)	< -128 dBu (200 Ω, 22 Hz - 22 kHz)
Maximum gain, analog in to out	90 dB
Bandwidth	10 Hz - 50 kHz (+0 dB, -1 dB)
Common Mode Rejection	≥ 90 dB @ 1 kHz
Mic Input impedance	> 2 kΩ
Line Input impedance	> 10kΩ

7.2. Line input

Number	1 x 2 channels
Format	2 channels, electronically
Socket	Female 5-pin XLR 1 : Ground 2 : Line 1 + 3 : Line 1 – 4 : Line 2 + 5 : Line 2-
Maximum input level	+24 dBu
Bandwith	10 Hz - 50 kHz (+0 dB, -1 dB)
Commun mode rejection	≥ 90 dB @ 1 kHz
Input Impedance	> 10kΩ

7.3. AES inputs

Number	3
Format	AES-3
Socket	XLR male 3-pin Switchcraft
Digital microphone powering mode	"Phantom", 10 V 250mA by socket AES-42 normalization

7.4. "Line Out" balanced analog outputs

Number	2
Format	2 channels, electronically
Socket	Male 5-pin XLR 1 : ground 2 : Line 1/3 + 3 : Line 1/3 – 4 : Line 2/4 + 5 : Line 2/4-
Output attenuators (Pad)	-40 dB, balanced, separate for L and R
Maximum output level (= 0 dBFS)	Adjustable via menu, -9 dBu to +22 dBu
Source impedance	≤ 100 Ω
Output balance	≥ 40 dB, 20Hz - 20 kHz
Accuracy	> 60 dB, 20Hz - 20 kHz
Channel isolation	> 90 dB (22Hz - 22 kHz)
Signal/Noise Ratio	> 80 dB (soit THD+N < 0,01 %)
SINAD (Signal to Noise and Distortion Ratio)	≥ 40 dB, 20Hz - 20 kHz

7.5. "Line Out" unbalanced analog outputs

Audio signals are the same as line output 1 and 2.

Format	2 channels, unbalanced
Socket	Mini-jack 3.5mm, stereo
Output level	6dB below balanced output
Maximum output level	+16 dBu
Source impedance	≤ 100 Ω

7.6. Digial outputs

3 mini XLR TA3 provide 2 digital channels 3 times.

The pin allocation of the “TA3” socket is as follows:

Pin	Function
1	**Ground**
2	**+ Output**
3	**- Output**

The outputs levels have an AES level, 4Vc-c110 Ω.

The SPDIF adaptor cable (See Annex: Accessory), make audio level adaptation to have these characteristic:

Protocol	CEI 958 , SPDIF, "consumer"
Format	Unbalanced, Transformer isolated
Connector	RCA mal
Level (on 75 Ω)	0,5V c-c
Source Impedance	75 Ω

7.7. Headphone output

Socket	Jack 6.35mm, stereo
Maximum output level	+20 dBu
Acceptable output load	≥ 16 Ω

7.8. "Direct I/O" interface

Pinout of the subD 9 pins:

Pin	Function
1	Pre microphone amplifier channel 1
2	Pre microphone amplifier channel 3
3	Ground
4	Contact
5	power (+2,5v)
6	Pre microphone amplifier channel 2
7	Pre microphone amplifier channel 4
8	Ground
9	Command input (0V..+2.5V)

7.9. "EXT I/O": Interface for RF transmitters/receivers

Socket	12-pin, Neutrik MiniCon
Audio signals for transmitters	Unbalanced, 2 channels, line level
Maximum level	Adjustable via menu, -20 dBu to +10 dBu
Source impedance	1 kΩ

The pin allocation of the “EXT I/O” socket is as follows:

Pin	Function	Direction
1	L signal to RF transmitter	Output
2	Not used	-
3	Analog signal ground	-
4	Analog signal ground	-
5	R signal to RF transmitter	Output
6	+ Input 4bis	Input
7	- Input 4bis	Input
8	+9V output	Output
9	- Input 3bis	Input
10	Analog signal ground	-
11	+ Input 3bis	Input
12	-	Input

Cable connector reference: NEUTRIK MINICON MRM.
This connector is available at AETA.

7.10. Power supply

Socket	Hirose HR10-7R-4S female 4 pins
Nominal Voltage	12 V
Minimum Voltage	8 V to supply 4MinX and 10V minimum for the battery charger
Maximum Voltage	18 V

The power socket Hirose 4 has following pin allocation:

Pin	Function
1	Ground
2	
3	+ External DC for the internal battery charger
4	+ 4Minx external DC input

Cable connector reference: HIROSE : HR10A-7P-4P(73)

7.11. Time Code

Pin out of the serial 0B LEMO 5 pins connector: EXG.0B305.HLN

Cable connector reference: LEMO FGG0B305CLAD52

Pin	Function	Direction
1	Ground	
2	LTC (camera output)	Input
3	ASCII	Input/output
4	Tuning	Output
5	LTC (camera input)	Output

Dimensions and weight

Dimensions (including connectors)	260 x 75 x 195 mm (10.2”x3.0”x7.7”)
Weight	1900 g

7.12. Environmental

4MINX can operate from–20 °C to +55 °C ambient temperature (-4 °F to 131 °F).

4MINX complies with EC directives regarding safety, EMC and hazardous substances (RoHS):

- Safety : compliant with EN60950
- Susceptibility: compliant with EN50082-1
- Emission: compliant with EN55022 (class B)

7.13. Hirose 10Pins option

On request 4MinX can be equipped with XLR3M in place of XLR5M outputs. In this case, only 1 and 2 channels will be available instead of the 4 channels.

Upon request, replacing the male base XLR5M outputs 3/4, 4MinX can be equipped with a base 10 pins Hirose RM15TRD-10S, for wire connection for "Go /Return", unbalanced, with a two channels analog recorder. The entrance is style accessible on the XLR 5F; the Hirose connector is connected in parallel.

1	Left output + (Line 3)	5	Right input + (Line 2)
2	Left output - (Line 3)	6	Right input - (Line 2)
3	Right output + (Line 4)	7	Left input + (Line 1)
4	Right output - (Line 4)	8	Left input - (Line 1)
9	Ground	10	Ground

8. Annexes

8.1. iXML

The BWF audio file is a WAF file with extended part under XML format, named iXML. We respect the xml version 1.0 encoding in UTF-8 and the iXML version 1.52. In this part many information are saved. Some data are automatically generated by the 4MinX and some can be modify by the user

Many data are also saved in the standard WAF header like notes and time code. In most case, sound editor read at first the waf header and complete data base by the iXML part.

Here is list of managed field by the 4MinX

Field	Set by	Description
<PROJECT>	User	Project name
<SCENE>	User	Scene index or Sequence/Scene
<TAKE>	User	Take index or Canvas take
<TAPE>	Auto	Set to 1
<FILE_UID>	Auto	Set to AAS4MI<4minx serial number>…
<NOTE>	User	Note on the take
<CIRCLED>	User	Mark good take
<USER>	User	User field
<WILD_TRACK>	User	Set to true if you select wide sound recording type
<TIMECODE_FLAG>	Auto	
<TIMECODE_RATE>	User	Frame format
<FILE_SAMPLE_RATE> <DIGITIZER_SAMPLE_RATE>	User	Audio sample rate frequency

<AUDIO_BIT_DEPTH>	User	Sample resolution
<CURRENT_FILENAME> <ORIGINAL_FILENAME>	Auto	The file name
<TOTAL_FILES>	Auto	Number of file for a record
<FAMILY_UID>	Auto	AAS4MI….
<FAMILY_NAME>	Auto	File name without file index
<FILE_SET_INDEX>	Auto	File index
<BWF_ORIGINATOR>	Auto	AAS: 4MinX
<BWF_ORIGINATOR_REFERENCE>	Auto	AAS
<BWF_ORIGINATION_DATE>	Auto	System date
<BWF_ORIGINATION_TIME>	Auto	System hour
<BWF_TIME_REFERENCE_LOW>	Auto	Time code information
<BWF_TIME_REFERENCE_HIGH>	Auto	Time code information
<BWF_DESCRIPTION>	Auto	Same as waf header : project, scene, take information
<TRACK_COUNT>	Auto	Number of track in the file
<CHANNEL_INDEX>	Auto	Track number in the file
<INTERLEAVE_INDEX>	Auto	Track interleave
<NAME>	User	Source Name
<FUNCTION>	User	Bus or Coupling information

8.2. Overview of connectors and front panel elements

4MinX's front panel :

1 Channel change setting keys

2 Channel gain

3 Panpot or other feature

4 Channel adjustment & status

5 Master gain & bus level L/R

6 External DC/Charge" LED

7 Function keys

8 Recording keypad

9 Monitoring menu access

10 Display

11 " On/Off – Escape key and OK key

12 Rotary interface

13 Headphone volume control

14 Slate microphone

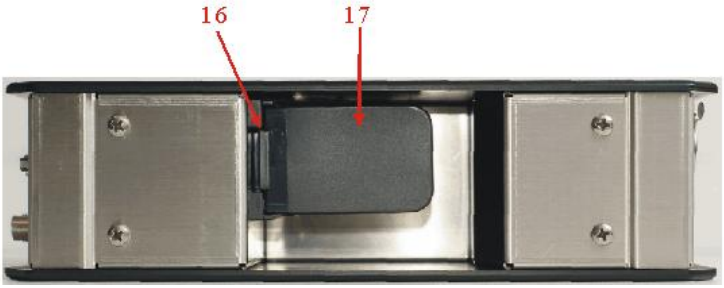
15 Shift key

4Minx's back panel :

1 Battery socket

2 NP-F Battery

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
F1
F2
F3
F4


16
17

Left Panel:

1 Mic/Ligne inputs (XLR3F)

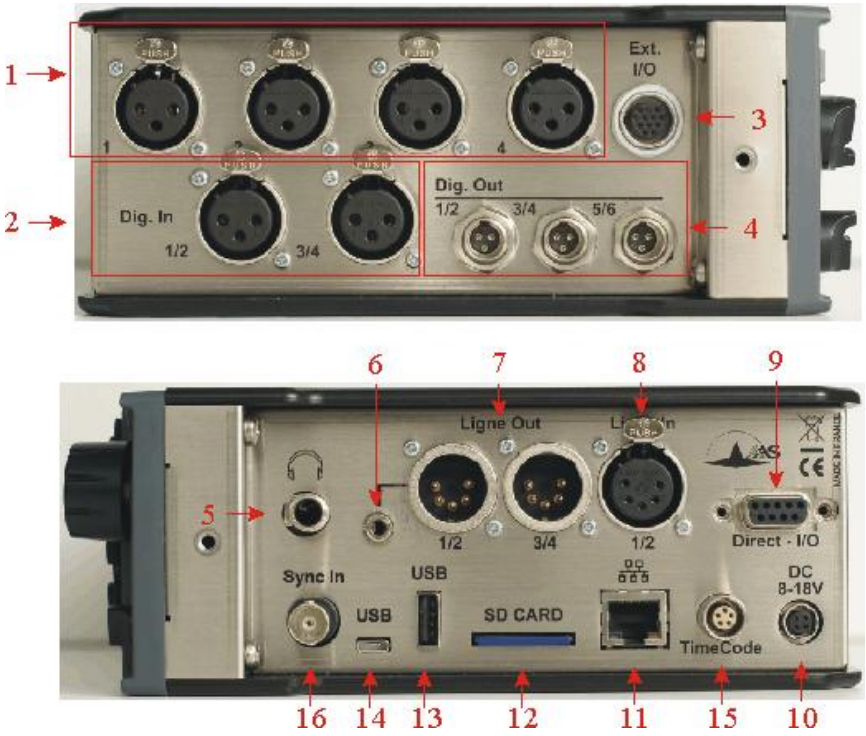
2 Digital inputs AES-3 / 42 (XLR3F)

3 Minicon 12pins interface for wireless transmitter/receiver

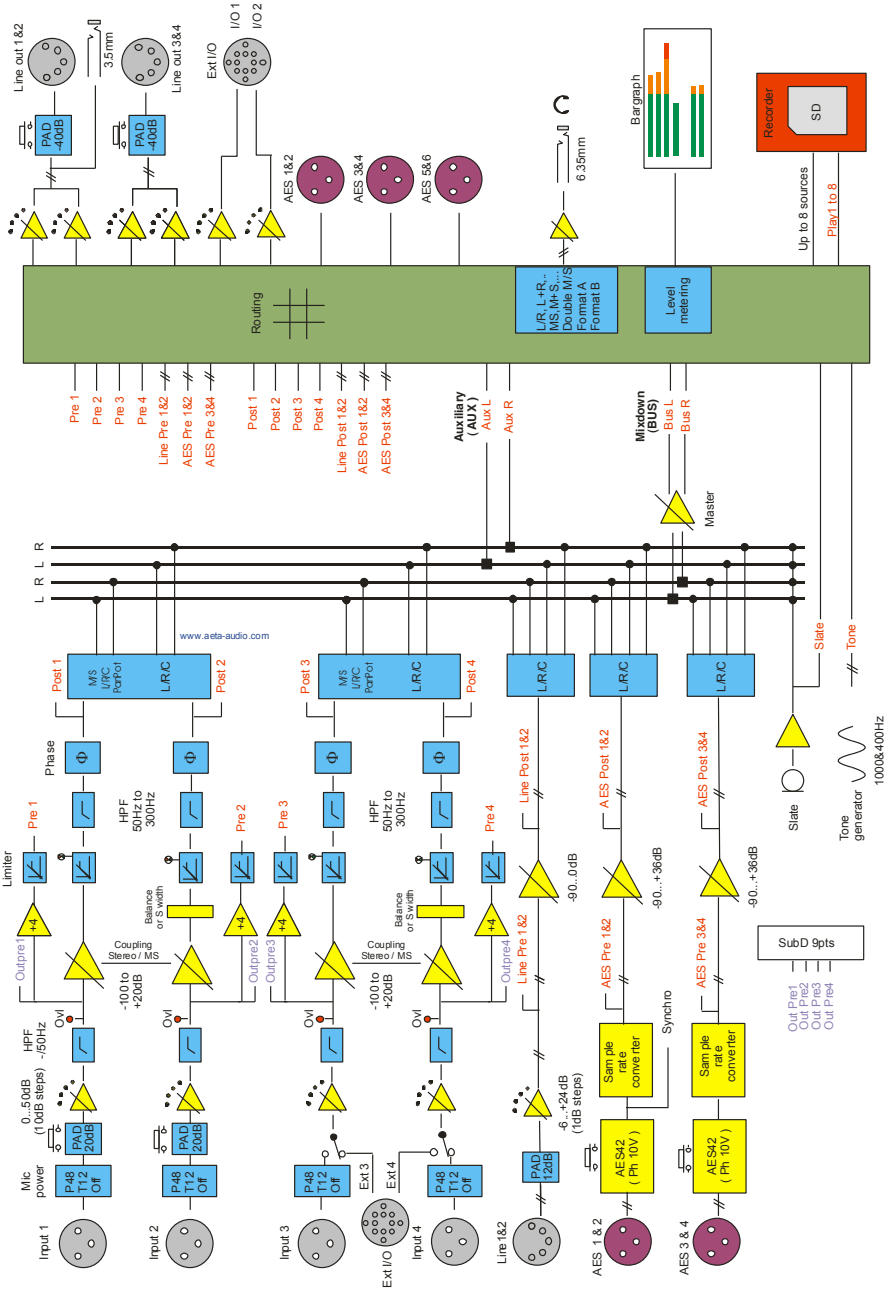
4 Digital outputs AES-3 (TA3)

Right panel:

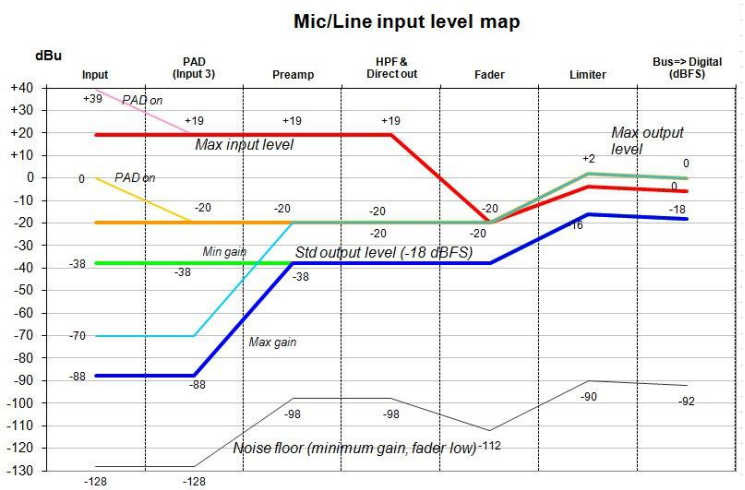
5 Stereo headphone output
6 Auxiliary stereo output, unbalanced
7 Main “Line” outputs, balanced
8 Line In / Return inputs
9 Direct outputs from the 4 channel
10 External power input
11 Ethernet interface
12 SD/SDHC-CARD holster
13 USB host
14 Micro USB 2.0 OTG
15 Time Code input/output (Optionel)
16 Word clock input (Optionel)

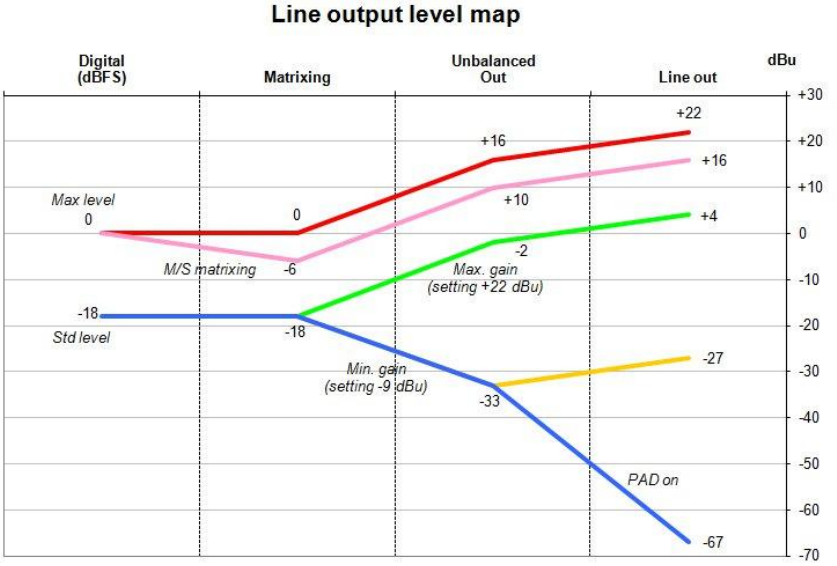


8.3. Block diagram

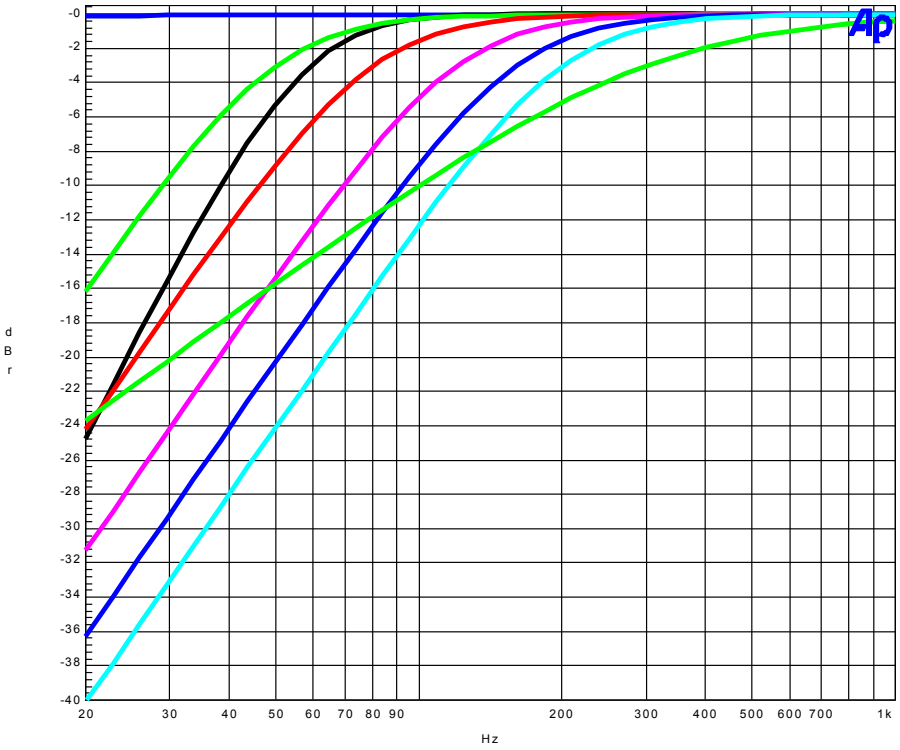

Line out 1&2
3.5mm
Line out 3&4
Ext I/O
I/O 1
I/O 2
PAD 40dB
AES 1&2
AES 3&4
AES 5&6
6.35mm
Bargraph
Recorder
SD
Up to 8 sources
Play1 to 8
Routing
L/R, L+R... MS, M+S... Double M/S Format A Format B
Level metering
Pre 1
Pre 2
Pre 3
Pre 4
Line Pre 1&2
AES Pre 1&2
AES Pre 3&4
Post 1
Post 2
Post 3
Post 4
Line Post 1&2
AES Post 1&2
AES Post 3&4
Auxiliary (AUX)
Aux L
Aux R
Mixdown (BUS)
Bus L
Bus R
Master
L R L R
www.aeta-audio.com
MS L/R Parrot
L,R,C
Phase
HPF 50Hz to 300Hz
Limiter
Balance or Swidth
Coupling Stereo / MS
-100 to +20dB
Ovl
HPF ./.50Hz
0...50dB (10dB steps)
Mic power
P48 T12 Off
PAD 20dB
PAD 12dB
-6...+24dB (1dB steps)
-90...0dB
-90...+36dB
Sam ple rate converter
Synchro
AES42 (Ph 10V)
Ext 3
Ext 4
Input 1
Input 2
Input 3
Input 4
Ext I/O
Line 1&2
AES 1 & 2
AES 3 & 4
Slate
Tone
Tone generator
1000&400Hz
SubD 9pts
Out Pre1
Out Pre2
Out Pre3
Out Pre4

8.4. Level maps



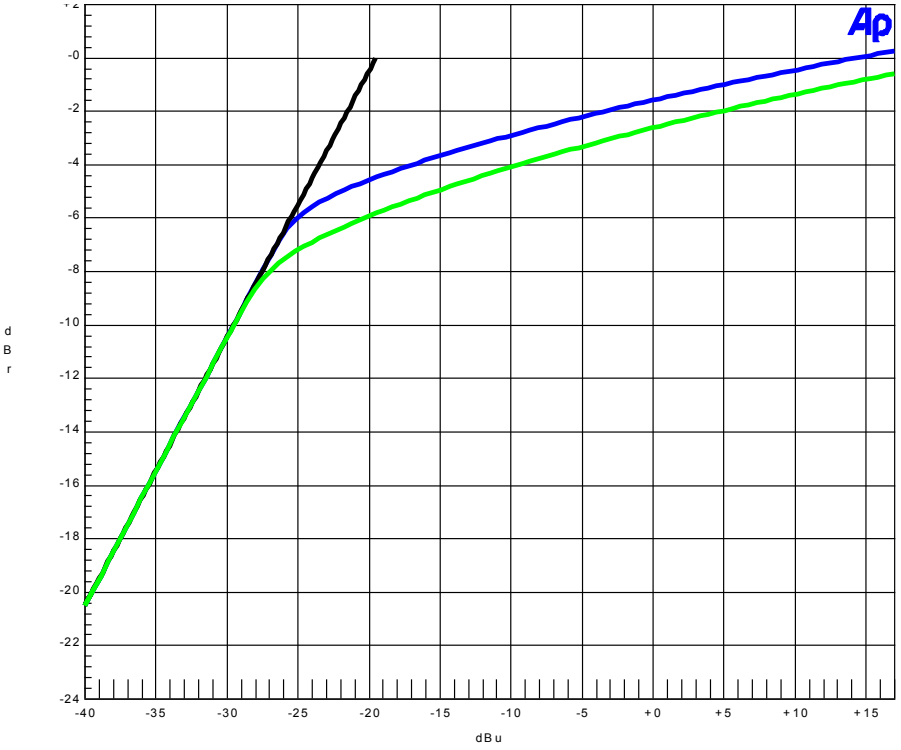


8.5. Filters



Blue	No filter
Black	50Hz 18dB/Oct Analog
Green	50Hz 12dB/Oct Digital
Red	80Hz 12dB/Oct Digital
Pink	120Hz 12dB/Oct Digital
Dark blue	160Hz 12dB/Oct Digital
Cyan	200Hz 12dB/Oct Digital
Green	300Hz 6dB/Oct Digital

8.6. Limiter



Black	No limitor
Blue	Threshold set to -6dBFs
Green	Threshold set to -8dBFs

8.7. Accessories

Many accessories are available, including:

Power supply AC/DCconvertor

NPF-960 Battery

NP1 holdster for NP1 battery

Car adaptor power cable

Adaptor cable XLR5 to 2 XLR3 for line outputs

Adaptor cable from 2 XLR3 to XLR5 for line inputs

AES adaptor cable from TA3 to XLR3

Specific adaptor cable for wireless microphone receiver and transmitter

Compact keyboard : QZERTY

Micro-A or Micro-B cable adaptor to HOST A interface

Carring Bag

Other (on request):
Adaptor cable for AES output to SPDIF on RCA
Adaptor Time code cable between Lemo 5 and 2 BNC connectors
MiniCon 12pins alone

9. Notes

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